REMARKS

Claims 1-3 are pending and amended herein.

Claims 1-3 are objected to for minor informalities cited by the Examiner. Claims 1-3 are amended herein in accordance with the Examiner's suggestions. Accordingly, it is respectfully submitted that the claim objections are overcome.

Claims 1-3 are rejected under 35 U.S.C. § 112, second paragraph on grounds of indefiniteness. The rejection is traversed and reconsideration is respectfully requested, particularly in view of the clarifying amendments to the claims.

The claims are amended herein in accordance with the Examiner's suggestions. Accordingly, it is respectfully submitted that the § 112, second paragraph rejection is now overcome.

Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama (U.S. Pat. No. 5,767,601) in view of Okamoto (U.S. Pat. No. 5,574,342) and further in view of Rosenberg (U.S. Pat. No. 3,411,027). The rejection is traversed and reconsideration is respectfully requested.

Uchiyama is directed to a permanent magnet electric generator having a raised output as compared with the output of a similar conventional permanent magnet generator in which the polar arcuate angle of the permanent magnets is equal to the polar arcuate angle of controlling magnetic poles.

Okamoto is directed to a brushless motor having a drive coil, a stator core, and a rotor. The stator has a plurality of main teeth and a plurality of auxiliary teeth arranged between the plurality of main teeth. The drive coil comprises a main coil and first and second sub coils. The main coil and first and second sub coils are wound on the teeth in a particular way as set forth in Okamoto.

Rosenberg is directed to an electric machine with a permanent magnet rotor in which flux, and hence the generated voltage or speed of the machine, is controlled by varying the direct voltage applied to the excitation winding of a

magnetizable structure joined with the stator in magnetic shunt relation thereto. The controllable magnetomotive force of the shunt becomes additively or subtractively superimposed upon the magnetomotive force of the rotor magnets and thus increases or decreases the resultant flux depending upon the polarity and magnitude of the shunt excitation voltage.

Uchiyama is an inadequate primary reference taken either alone or in combination with Okamoto and Rosenberg for rendering claims 1 and 2 obvious. More specifically, Uchiyama shows the direction of current applied to the field controlling coil, which is changed from –2A to +2A through 0A. However, Uchiyama does not teach or suggest changing the amount of current flowing into the field controlling coil, as recited in claims 1 and 2 and described in the specification of the present invention (see Fig. 3). In other words, even if the teaching of Uchiyama were combined with that of Okamoto and Rosenberg, the combination would not arrive at the present invention as recited in claims 1 and 2. Accordingly, the teaching of Uchiyama taken either alone or in combination with that of Okamoto and Rosenberg does not render claims 1 and 2 obvious.

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenberg (U.S. Pat. No. 3,411,027) in view of Okamoto (U.S. Pat. No. 5,574,342). The rejection is traversed and reconsideration is respectfully requested.

Similar to the discussion set forth above with respect to Uchiyama, the Rosenberg and Okamoto references each do not teach or suggest changing the amount of current flowing into the field controlling coil, as recited in claim 3 and described in the specification of the present invention (see Fig. 3). In other words, even if the teaching of Rosenberg were combined with that of Okamoto, the combination would not arrive at the present invention as recited in claim 3. Accordingly, the teaching of Rosenberg taken either alone or in combination with that of Okamoto does not render claim 3 obvious.

In view of the foregoing, it is respectfully submitted that amended claims 1-3 are allowable. All issues raised by the Examiner having been addressed, an early action to that effect is earnestly solicited.

Applicants herein petition for a one-month extension of time to file this Response. A check in the amount of $ 110.00 is enclosed to cover the extension fee. No additional fees or deficiencies in fees are believed to be owed. However, authorization is hereby given to charge our Deposit Account No. 13-0235 in the event any such fees are owed.

Respectfully submitted,

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Marked-up Version of Amendments

A marked-up version of the amendments is set forth below showing additions with underlining and deletions between brackets.

In the Claims:

Claim 1

1. (Amended) A brushless motor having a stator around which an armature coil is wound; a rotor rotatably arranged in [one of] an inside [and an outside] of said stator or in an outside of said stator; a rotor position detecting means for detecting a position of said rotor; and a current control means for making a current flowing into said armature coil such that a rotating magnetic field is formed between said armature coil and said rotor in accordance with a detected result of said rotor position detecting means, the brushless motor comprising:

a [fieldmagneton] field magneton including a plurality of permanent magnets provided in said rotor and [magnetized at the same pole] disposing the poles in one direction, and a plurality of control poles made of a magnetic material and arranged between said permanent magnets;

a field coil forming a closed magnetic path passing through said control poles; and

a motor characteristic control means for changing a motor characteristic by controlling at least one of a direction and an amount of current flowing into said field coil, by changing a magnetic flux that said field coil generates, and by controlling an effective magnetic flux affected between said rotor and said stator.

Claim 2

2. (Amended) A brushless motor having a stator constituted such that an armature coil is wound around a stator core having a gap at a central portion thereof; a rotor made of a magnetic material and including a bottomed cylindrical yoke rotatably arranged outside said stator; a rotor position detecting means for detecting a position of said rotor; and a current control means for making a current flowing into said armature coil such that a rotating magnetic field is formed between said armature coil and said rotor in accordance with a

detected result of said rotor position detecting means, the brushless motor comprising:

a [fieldmagneton] field magneton including a plurality of permanent magnets provided in said rotor and [magnetized at the same pole] disposing the poles in one direction, and a plurality of control poles made of a magnetic material and arranged between said permanent magnets;

a [boss] rotor boss made of a magnetic material, provided at the central portion of said rotor to project along an axial direction thereof, and arranged in said gap of said stator so as to have an air gap between said stator and the [boss] rotor boss;

a field coil arranged in said stator so as to face a bottom portion of said yoke in a state of being wound in a surrounding direction of said [boss] rotor boss, and forming a closed magnetic path passing through said [boss] rotor boss, said yoke, said control poles and said stator core; and

a motor characteristic control means for changing a motor characteristic by controlling at least one of a direction and an amount of current flowing into said field coil, by changing a magnetic flux that said field coil generates, and by controlling an effective magnetic flux affected between said rotor and said stator.

Claim 3

3. (Amended) A brushless motor having a stator including a stator core around which an armature coil is wound, and a bracket which holds said stator core and is made of a magnetic material; a rotor made of a magnetic material and including a rotor core rotatably arranged inside said stator; a rotor position detecting means for detecting a position of said rotor; and a current control means for making a current flowing into said armature coil such that a rotating magnetic field is formed between said armature coil and said rotor in accordance with a detected result of said rotor position detecting means, the brushless motor comprising:

a [fieldmagneton] field magneton including a plurality of permanent magnets provided in said rotor and [magnetized at the same pole] disposing the poles in one direction, and a plurality of control poles made of a magnetic material and arranged between said permanent magnets;

a magnetic path forming member made of a magnetic material, projected from said rotor core along a diametrical direction thereof, and arranged so as to have an air gap in the space of the stator with a gap between the stator and the magnetic path forming member;

a field coil arranged in a side of said stator in a state of being wound in a surrounding direction of said rotor core, and forming a closed magnetic path passing through said rotor core, said control poles, said stator core, said bracket and said magnetic path forming member; and

a motor characteristic control means for changing a motor characteristic by controlling at least one of a direction and an amount of current flowing into said field coil, by changing a magnetic flux that said field coil generates, and by controlling an effective magnetic flux affected between said rotor and said stator.